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U.S. DEPARTMENT OF JUSTICE

Antitrust Division

ANTITRUST IN NETWORK INDUSTRIES

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I. Introduction

Today I would like to delve into a variety of business strategy and antitrust issues that arise in so-called *network industries*. Network industries are those in which consumers attach themselves to one or more networks. These networks can be *real* or *virtual*. Real networks include communications and transportation networks, such as telephone, facsimile, computer, railroad, or electricity networks. Virtual networks are collections of users who have adopted compatible technology, such as the network of users of Macintosh computers, the network of users of Sega video game machines, or the network of users of VHS video tape machines. Both real and virtual networks tend to exhibit *positive feedback* due to *demand-side scale economies*: large networks are more attractive to buyers, and thus tend to get larger.

Many of today's most exciting network industries are information-based industries involving communications and/or computers. From computer software and hardware, to fax machines and video game systems, to compact discs and digital video discs, to communications networks and the Internet, technology is the driver and compatibility the navigator. Competition in these industries is qualitatively different than it was in the manufacturing industries of yesteryear.

As the Transamerica Professor of Business Strategy at Berkeley, I have long sought to understand how firms compete in network industries, and especially in high-tech network industries experiencing

rapid technological progress.¹ As Deputy Assistant Attorney General for Economics at the Antitrust Division, I now am charged with helping enforce the antitrust laws in these same industries. In my view, sound antitrust policy depends upon a solid understanding of business strategy and economics, as well as the case law. I therefore welcome the opportunity to examine and evaluate the Division's enforcement policies anew in these unique and dynamic network industries.²

¹I have been studying network industries for over a decade, largely with my colleagues Joseph Farrell and Michael Katz, the current and former chief economists at the FCC. For early contributions, see Michael Katz and Carl Shapiro, "Network Externalities, Competition, and Compatibility," *American Economic Review*, June 1985 and Joseph Farrell and Garth Saloner, "Installed Base and Compatibility: Innovation, Product Preannouncements, and Predation," *American Economic Review*, December 1986. Over the past ten years, an extensive economics literature discussing business strategy and public policy in network industries has developed. A review of this literature circa 1990 is provided by Paul David and Shane Greenstein, "The Economics of Compatibility Standards: An Introduction to Recent Research," *Economic Innovation and New Technology*, 1990. Brian Arthur, "Positive Feedbacks in the Economy," *Scientific American*, February 1990, provides an entertaining and accessible introduction to positive feedback in network industries. My paper with Michael Katz, "Systems Competition and Network Effects," *Journal of Economic Perspectives*, Spring 1994, provides a relatively recent non-technical review of the literature. A companion paper, Stanley Besen and Joseph Farrell, "Choosing How to Compete: Strategies and Tactics in Standardization," *Journal of Economic Perspectives*, Spring 1994, contains a nice discussion of some basic business strategies in network industries. Here, I draw on this growing literature selectively for the purposes of articulating antitrust enforcement policy in network industries.

²Both the DOJ and the FTC are examining antitrust policy in network industries. At the recent FTC Hearings, a number of witnesses discussed the proper role for antitrust in network industries.

As I hope to make clear today, the mere fact that many of these industries are highly dynamic, and are experiencing rapid technological change, hardly implies that antitrust enforcers should sit on the sidelines, watching firms engage in technology and standards battles. To the contrary, our job is to ensure that incumbent firms do not use their power to block technological progress. At the same time, we must be careful not to impose any drag on the healthy competitive dynamic that prevails in many network industries.

II. A Parable: Dynamic Competition with Network Externalities

To bring some of the key business strategy and antitrust ideas alive, let's follow the life cycle of a computer program, say a graphics program that runs on personal computers, from a first-person perspective.³ So, imagine yourself a promising entrepreneur in the computer software industry. Our story begins with your frustration at the limitations of the existing graphics software. You are convinced that the leading program, UGraph, lacks several significant features that you can provide with a new program of your own design. You hire the necessary programmers and develop your improved program, ZipGraph, all the while trying to make it easy for users of UGraph and other existing programs to switch to yours. Your basic approach is to

³Prior to joining the Antitrust Division, I served as an economic expert for the FTC during its investigation of the Adobe/Aldus merger, which involved professional graphics software running largely on Apple Macintosh computers. However, this parable is merely intended to illustrate some of the dynamic issues that arise in markets with network externalities, and does not reflect the actual fact pattern in the market for professional graphics software. I defer discussion of the antitrust issues raised in this parable until completing the parable.

achieve as much compatibility as possible with existing programs, without violating the intellectual property rights of incumbents or sacrificing the performance and quality improvements that make your product attractive in the first place.

Knowing that users are unlikely to buy new hardware or change operating systems just to use your new software, you decide to create versions of ZipGrapher that will run on the one or two most popular hardware and operating system platforms. Since you do not sell hardware or operating systems, this requires some degree of cooperation and interaction with firms supplying hardware and operating systems. Fortunately for you, none of the platforms insists upon exclusivity.

In all likelihood, ZipGrapher will fail. Oh, it may well be superior to UGraph and other popular programs in a number of ways. But it is notoriously difficult for new programs to provide sufficiently great improvements in performance to justify the switching costs users would have to incur to adopt them. After all, learning a new graphics program is a real pain for most people, and few are inclined to venture out and try a new product, even if it claims to be able to transfer complex graphics files nicely from and to the more popular formats. Even if you price your wonderful ZipGrapher program very aggressively, to the point of giving it away to certain users you hope will be influential, the odds are still against your program catching on.

If your ZipGrapher program does fail, you may well attribute that failure, at least in part, to some of the tactics employed by USoft, the firm controlling the leading graphics program, UGraph. Perhaps USoft introduced an aggressive "competitive upgrade" pricing scheme for UGraph, targeted specifically at users who tried your product. You might complain that USoft "strategically" pre-announced new versions of UGraph, claiming that these new versions would match the performance of ZipGrapher, with the express aim of inducing the large installed base of UGraph users to wait rather than buy ZipGrapher. You might also complain that USoft went out of its way to sow fear, uncertainty, and doubt in users' minds about just how well UGraph files can be transferred into ZipGrapher format, or how difficult it would be for UGraph users to learn to use ZipGrapher. In fact, USoft might have denied you the opportunity to offer a fully compatible product in a timely fashion, either by withholding key information about their program, or by refusing to give you a necessary patent or copyright license. Perhaps USoft even threatened you with infringement actions based on what you regard as overly broad assertions of patents and copyrights. Maybe it is time to give a call to the Justice Department.

On the other hand, maybe, just maybe, your program will survive, and even prosper. Perhaps the incumbent programs, especially the market leader UGraph, have fallen far enough behind the cutting edge in technology to leave a real opening for you. Or, perhaps the established programs -- UGraph, and the older but still popular SlowGrapher -- each are bogged down by their desire to

maintain compatibility with their own installed base of ever-older versions. It is even possible that you just had a great idea and a great development team, and leapt ahead of the incumbents. If some of these lucky circumstances apply, you may be able to attract enough interest for your new graphics program to survive.

What tactics will you employ to transform some initial interest in your novel ZipGrapher product into commercial success? The name of the game is to build and maintain an installed base of active users. Very likely you will be highly aggressive in your pricing, what with the tiny extra cost of making extra copies and the enormous value of building an active installed base. You certainly cannot rest on your laurels after ZipGrapher 1.0, but must press ahead to offer even better performance with ZipGrapher 2.0 to grow your installed base of users. If you are lucky as well as skillful, your product may do more than merely survive and appeal to a niche of loyal customers. It may grow to become the next dominant graphics program, just as UGraph at one time dethroned SlowGrapher. If you are really lucky or very skillful, you may succeed in initiating a bandwagon supporting ZipGrapher, and ride positive feedback to market leadership.

With success, your perspective changes radically, and antitrust looms larger. How do you protect your valuable position as industry leader and standard-bearer? You have not failed to notice that industry leadership has done wonders for your market capitalization. What's your next move?

Surely the best approach is to keep doing what got you here: anticipating user needs, offering the best performance, paying careful attention to distribution channels and marketing, foreseeing and exploiting further hardware improvements, and working effectively with your hardware and software partners. If you can achieve these goals, you may be able to defend your dominant position, all the while offering tremendous value to consumers.

But temptations arise. You know that there are any number of small, hungry companies out there just looking to dethrone you with their own HyperGrapher. You know the danger all too well: an upstart firm, with younger programmers and new ideas, just might outwit your crack software development team. Or, perhaps, an industry giant lacking a graphics program will enter the market, with all of its brand name equity, its distribution muscle, and its track record of writing innovative, object-oriented software programs. You are generous in funding R&D, but several large firms in the industry have abundant sources of internal financing, and the venture capitalists are ever looking for the next meteor to ride to an extraordinary return on capital. As if that were not bad enough, there is always the risk that one of the firms selling the hardware or operating systems on which ZipGrapher runs will come out with their own graphics program.

So, even while you work tirelessly to improve your product, in no small part to drive upgrade sales, the very tactics that worried you when you were first getting started now begin to seem rather

appealing. You are tempted to warn consumers of the dangers of switching to the new, incompatible HyperGrapher program. You are tempted to transform your intellectual property into a strategic advantage by blocking HyperGrapher from achieving full compatibility with ZipGrapher. You are tempted to tell consumers in advance when you are getting ready to introduce a new version of ZipGrapher. You are tempted to launch a "Come Back Home" campaign offering the latest version of ZipGrapher at rock-bottom prices to users who have recently tried HyperGrapher.

Now that you are the market leader, you feel a bit uneasy about employing the tactics you found so objectionable when you were new in the market. But some of these stratagems look promising from a strategy perspective, and some of your trusted lieutenants (the ones receiving significant compensation in the form of stock options) feel that a more aggressive stance would go far to solidify ZipGrapher's hold on the market. Perhaps it is time to seek antitrust counsel.

With your growing market presence, you are also thinking about acquisitions as a way to further strengthen your position. You are attracted to the idea of selling ZipGrapher in conjunction with the leading spreadsheet program, either through an exclusive joint marketing arrangement or an outright merger. Could either of those strategies run you afoul of the antitrust laws? In addition, you have been carefully watching the declining market share of SlowGrapher, which is now used by a mere 10% of the market; SlowGrapher's share

of new shipments is even lower. You would like to get your hands on their customer list and migrate SlowGrapher users to ZipGrapher, both to grow your market share and to lock up a group of customers that might otherwise help support entry by HyperGrapher. But you wonder: with your 50% share of the installed base, and 70% share of new shipments, would an acquisition of SlowGrapher raise antitrust problems? Finally, you are trying to map out a strategy in case a large hardware firm or operating systems vendor expresses an interest in acquiring *your* firm. No doubt about it, you had better get some antitrust advice, and quickly.

III. General Economic Principles

This little parable is meant to illustrate some very real strategic and legal issues that arise in certain network industries where competition is highly dynamic, such as the computer software industry and the video game industry, to name just two. Similar issues, as well as some quite novel questions involving the creation of jointly owned networks, and access to such networks, arise in other network industries, e.g., in the ATM and credit-card industries. Business strategies in all of these network industries are rich and complex.

What are the implications for antitrust enforcement? Even more so than in other areas, antitrust policy in network industries must pay careful attention to firms' business strategies, the motives behind these strategies, and their likely effects, with the ultimate aim of preserving competition, so as to promote efficiency and maximize consumer

benefits in the long run. No simple rules are available, but we at the Antitrust Division are prepared to commit the resources necessary to investigate conduct in these industries that might harm competition. Furthermore, antitrust enforcers must be alert in these industries, because the very nature of the "positive feedback" cycle means that monopolization may be accomplished swiftly. And, once achieved, the network effects that helped create dominance may make it more difficult for new entrants to dislodge the market leader than in other industries lacking network characteristics.

Because our investigations in network industries are typically complex, fact-specific, and driven by changing technology, I cannot draw bright lines for you delineating pro-competitive from anticompetitive behavior in network industries as a general matter. Still, I feel strongly that economic learning developed over the past decade can be tremendously valuable in informing sound antitrust enforcement efforts in these areas, and in reaching solid conclusions in specific investigations. My goal here today is to give you a sense of how this occurs at the Antitrust Division.⁴

⁴I must stress that I can only give you a glimpse here of how economics informs antitrust policy in network industries, for three major reasons. First, my topic is far too rich and complex to cover in a single speech; a closer look at the economics literature, at our enforcement actions, at the record from the recent FTC hearings, and at the case law, will do much to supplement my discussion here. Second, both the economics and the law in these areas are still evolving, as new research is conducted, and as new cases arise and are scrutinized by the enforcement agencies and the courts. Third, my discussion here is largely confined to unregulated industries, and thus omits many important antitrust issues in the telecommunications industry, the electricity industry, and other network industries subject to price or entry regulation.

To this end, I would like first to discuss a number of economic principles in network industries, drawing out their implications for antitrust enforcement policy. Then I shall apply these principles to several types of business conduct that arise in network industries, and to a handful of important antitrust cases in such industries.

A. Innovation is King

The key driver of consumer benefits in information industries is technological progress. Thus, the primary mission of antitrust in these industries must be to promote and protect competition in the introduction of new and improved products and services. Of course, antitrust law seeks to insure that independent firms offering comparable technology compete vigorously on price, but very often the most potent form of competition is from new products, not just lower prices.

New products do not appear magically; and technological progress does not occur willy-nilly. Both require the investment of financial and human capital, which are attracted only if the winners are able to reap rewards. For these powerful reasons, there is no fundamental tension between antitrust law and intellectual property rights. This logic is well articulated in the DOJ and FTC "Antitrust Guidelines for the Licensing of Intellectual Property," which were issued in April 1995.

It is not infrequent for one firm to wrest industry leadership away from another as technology advances from one generation to the next. This is Schumpeterian "creative destruction" at work to deliver ever-better products to consumers. The single most important goal of antitrust in network industries is to insure that competition from new products and new technologies is not stifled.

Because innovation is such a strong force in many high-technology markets, companies are tempted to defend their conduct by arguing that entry is easy or inevitable, and thus durable market power or monopoly power is unobtainable. Sometimes this argument may be quite valid, but beware of overusing it: there is no antitrust immunity for high-tech industries. The fact is, rapid technological progress does not equate to low entry barriers, especially if users find it very costly to switch to new brands that are incompatible in some way with the established technology.

B. Cooperation is the Norm

Cooperation among participants in network industries is the norm, not the exception, and serves a variety of beneficial purposes. As a general rule, cooperation among suppliers of complementary products, which we might call "vertical cooperation," can be highly beneficial.⁵ If anything, this principle applies even more strongly in

⁵Hardware and software are economic complements because the demand for hardware rises if software becomes better and cheaper, and vice versa. For example, a video game player and the (compatible) games that play on it are complements. Standard antitrust principles tell us that collusion, i.e., cooperation

network industries: hardware and software suppliers make sure their products work together smoothly, suppliers of operating systems provide development tools to software developers to promote the supply of compatible software, and cable television operators invest in programming to supply to their customers. Vertical cooperation raises antitrust dangers only when it contains an element of exclusivity.

Cooperation among direct rivals, which we might call "horizontal cooperation," is of course more likely to raise antitrust concerns than is vertical cooperation. However, horizontal cooperation also can be pro-competitive, in the proper circumstances. For example, rival firms may agree upon a new product standard to ensure compatibility, as when Sony and Philips jointly established standards for compact discs around 1980.⁶ Indeed, such cooperation may be critical for a new product to compete successfully with established products. If so, such cooperation to achieve compatibility cannot become anticompetitive merely because it is successful in establishing a new industry standard. Of course, horizontal cooperation for the purposes

in pricing, among suppliers of *substitute* products, typically harms consumers. By very close analogy, cooperation among suppliers of *complementary* products typically benefits consumers. In the context of vertical integration, this is recognized under the rubric of solving the "double marginalization" problem, an argument for why vertical integration can lead to lower prices. This has been understood by economists since Cournot's work in 1838.

⁶Such cooperation often takes place under the auspices of a formal standard-setting body, and may include safeguards to prevent one or a few firms from "controlling" the standard. However, in the case of Sony and Philips, the Digital Audio Disk Council declined to endorse the Sony/Philips CD standard, choosing instead to leave the selection of a standard to the market.

of standard setting does not justify cooperation in production, marketing, or pricing.

C. Strategy is Dynamic

My computer software parable was quite consciously organized around the *life cycle* of an innovative product in a network industry. Taking a snapshot of competition at a single point in time would have been quite inadequate, either to understand the strategies involved or to assess the legality of various tactics. Having worked with dynamic, game-theoretic models of business strategy for my entire professional career, I am well aware of the pitfalls of employing static analysis in dynamic industries, and the information industries are nothing if not dynamic.⁷ For example, pricing strategies in network industries are usually highly dynamic, due to the strategic importance of building and maintaining an installed base of users.

D. Compatibility is Key

Compatibility determines the size and number of virtual or actual networks in a network industry; two products that are fully compatible belong to or benefit from the same real or virtual network. Therefore, a firm's ability to make its product compatible with other products affects the value, sometimes even the commercial viability, of its

⁷Indeed, I am bemused when economists are broadly criticized for using static models of perfect competition (read: basic supply and demand tools) to study complex, dynamic industries. Such critics just don't know what industrial organization economists and business strategy scholars have been doing the past twenty years.

product. Compatibility can be a tremendous source of competitive advantage; incompatibility can constitute a stiff entry barrier.

When Borland introduced its Quattro Pro spreadsheet in the 1980s, it went to great efforts to make Quattro Pro compatible with the then-dominant spreadsheet, Lotus 1-2-3. In this case, there were two key aspects to compatibility: Borland wanted to make it easy for users of Lotus 1-2-3 to learn Quattro Pro, call it "user compatibility," and Borland wanted to make it easy for data files to be transferred between Quattro Pro and Lotus 1-2-3, call it "file compatibility." In my lexicon, Borland quite naturally wanted access to Lotus's network, i.e., Lotus's installed base of users, which constituted a major portion of the market for spreadsheets. The litigation that ensued between Borland and Lotus involved the question of whether Lotus's copyright protection precluded Borland from offering certain types of user compatibility in Quattro Pro without Lotus's permission.

Many of the battles in network industries involve efforts to join existing networks, to protect established networks, and to establish new networks. As Michael Katz and I have shown, incumbent firms often wish to prevent rivals from hooking into their networks, while entrants typically strive to do just that, unless they can offer dramatic technical improvements on an incompatible basis.⁸ Intellectual property rights, tempered by sound antitrust enforcement, often

⁸See especially Michael Katz and Carl Shapiro, "Technology Adoption in the Presence of Network Externalities", *Journal of Political Economy*, 1986.

determine whether a network can be kept proprietary or not. Some of the most fundamental strategic questions revolve around firms' decisions to establish or participate in "open" networks or "closed," proprietary networks. While IBM has been criticized in business strategy circles for making its PC network too "open," and ultimately losing control of that network to Intel and Microsoft, Apple has likewise been criticized for keeping its network too "closed," refusing, until quite recently, to license hardware "clones" of the Macintosh.

E. Expectations are Critical

I presume that every one of you has purchased numerous consumer electronics devices -- either televisions, compact disk players, video tape players, or computers -- for your home. In making these purchases, I'm willing to bet that you gave at least some thought to the question of where technology was heading: Should you wait for prices to fall further? Will you be left stranded with a technology that might flop, such as quadraphonic sound, stereo AM radio, or certain brands of personal computer best left unnamed? Or, are you buying a product that will never develop much of a following, making it more difficult for you to get repair services, upgrades, or spare parts when your unit gets older?

My point is this: purchase decisions in network industries are heavily influenced by *buyers' expectations*. The positive feedback endemic to network industries derives in part from the importance of expectations: a product that is expected to fail often *will* fail; a

product that is expected to succeed often *will* succeed. For example, at some point in the late 1980s in the U.S. (earlier in Japan), users decided that fax machines would be widespread and thus quite valuable, and this became a self-fulfilling prophecy. Indeed, faxes still dominate e-mail for instant communications of text. Now the Internet is widely expected to continue to grow rapidly; these beliefs themselves make the Internet more attractive to users, and thus more likely to in fact grow rapidly in the future. This is the essence of the positive feedback of networks.

Because expectations are so critical, much business strategy in network industries is devoted to influencing expectations. At one point, WordPerfect sued Microsoft over Microsoft's claim that its word processing software was the most popular in the world. And Visa has had a long-running advertising campaign telling consumers that Visa cards are accepted "everywhere you want to be," whereas merchants "don't take American Express." Just recently, Sun assembled an impressive coalition of visible supporters for its Java software (including IBM, Apple, DEC, Adobe, Silicon Graphics, Hewlett Packard, Oracle, and Toshiba) to convince software developers that Java would indeed become the industry standard for authoring certain material for the Internet. Having a great product helps get a bandwagon going, but a great product can fail if it suffers from unfavorable expectations. From an antitrust perspective, a dominant firm that undermines expectations regarding the viability of an alternative product may strike a damaging blow to its upstart rival. Investigation may be warranted to determine whether the dominant

firm is merely informing customers of the drawbacks of rival technology, or inaccurately maligning its would-be competitor. Thus, in my parable at the beginning of this speech, the Antitrust Division would be gravely concerned if USoft employed a campaign of fear, uncertainty, and doubt to cripple its rival ZipGraph by making false or misleading statements about ZipGraph.

IV. Implications for Business Conduct

I am now ready to apply these general principles to specific types of business conduct in network industries. In doing so, I should stress that my focus, as an antitrust enforcement official, is on the conduct of firms that have or might obtain monopoly power. Some forms of business conduct can be legitimate for firms with small market shares, yet anticompetitive when employed by dominant firms. The fact that small firms employ particular tactics suggests that they involve some efficiencies, but these efficiencies may be outweighed by anticompetitive effects when a dominant firm acts similarly.

A. Joint Standard Setting

Very often, a single firm is incapable of launching a new technology, especially if that technology is not compatible with existing products. I have already noted the example of Sony and Philips jointly promoting the compact disc technology. Cooperation of this sort has the advantage of avoiding a potentially unproductive standards war, in part by assuring consumers that they will not be

stranded if they invest in the new technology.⁹ Much like research joint ventures, cooperative standard setting also can permit the teaming firms to combine the best features of their technologies, as is claimed for the new high-definition television system.

At the Antitrust Division, all of these arguments are given serious attention, even while we look to make sure that rival firms are not using joint standard setting as an excuse to avoid competing directly against each other. This concern is greatest if two or more of the firms agreeing to a joint standard could independently have promoted comparable technology. Absent network effects or strong economies of scale, consumers are better served if the two rivals compete with their distinct product offerings, rather than agree to offer only a single product. With strong network effects, however, consumers may well be better off with a single network, i.e., with a *de facto* product standard, especially if two or more firms are able to offer products conforming to the standard without incurring any royalty liabilities. Even in this case, however, antitrust enforcers must ask whether competition to become the standard has been cut off prematurely, before technological avenues were adequately explored or before consumers realized the benefits of rivalry between firms jockeying to

⁹For a more extensive discussion of the antitrust aspects of joint standard setting, see James Anton and Dennis Yao, "Standard-Setting Consortia, Antitrust, and High-Technology Industries," *Antitrust Law Journal*, 1995. Anton and Yao emphasize situations in which standard-setting bodies may abuse their position by excluding new products for failure to meet safety standards. My focus here is distinct: on cooperation in the establishment of compatibility standards for new technology.

set the standard. Such concerns are lessened when the firms are genuinely combining complementary technology, so their joint standard is superior to anything either could have introduced on its own.

A somewhat different set of concerns arises when firms with a vested interest in current technology participate in the setting of standards for new and superior technology. In this situation, an incumbent firm may well have an incentive to slow down the arrival of the new technology, and thus preserve its proprietary advantage. As a matter of business strategy, the champions of the newer technology may have to break off from the incumbent firm and establish a new standard on their own, either in the market or through a standard-setting process. As a matter of antitrust policy, the incumbent firm is not compelled to endorse the newer technology, but it might generate antitrust liability if it engages in activity to block the new technology from being adopted. An investigation and fact finding will typically be necessary to determine the extent to which an incumbent is alerting industry participants to the genuine drawbacks of the new technology, protecting consumer benefits associated with compatibility by resisting splintering of an established standard, or baldly preserving its market power by blocking new, beneficial products or standards from emerging.

When firms cooperate to set standards, they may also set terms and conditions for the use of the technology embodied in the

standard. For example, in many cases the *quid pro quo* for industry acceptance of a standard is an agreement by the sponsoring firms to charge no royalties, or specified low royalties, or unspecified but "reasonable and non-discriminatory" royalties, for use of the intellectual property embodied in the standard.¹⁰ Offering long-term fixed-rate licenses to a new technology, in order to get a standard accepted initially, can be a highly attractive arrangement from an antitrust perspective: it allows consumers to enjoy the network benefits associated with compatibility, it enables many firms to compete to supply compatible technology, and it can greatly smooth the standards process, even while it permits the sponsoring firms to recover their R&D investments, either through the modest royalty payments or by virtue of their unique and superior knowledge of the underlying technology that may give them an ongoing technological edge. Still, market participants and antitrust authorities must be ever vigilant in markets with these features to prevent one firm from converting an initially open standard into a proprietary standard, unless such control is gained by genuine improvements and innovation that extend the open standard.

¹⁰The International Organization for Standardization (ISO) and the American National Standards Institute (ANSI) both require an innovator to agree to license on "reasonable" terms before they will incorporate proprietary technology into an official standard.

B. Compatibility and Access¹¹

I have already noted that compatibility, i.e., network access, is a key element of business strategy in network industries. As explored in my research with Michael Katz, incumbent firms often will find it profitable to deny access or compatibility to new entrants, and to seek to establish *de facto* standards for new products rather than participate in industrywide standard-setting efforts.

What are the antitrust implications of the fact that incumbents often wish to deny access or compatibility to would-be rivals? Requiring firms that control proprietary standards to open their technology up to others amounts to compulsory licensing, which runs the risk of undermining the purpose of the intellectual property laws. As stated in the DOJ and FTC Intellectual Property Guidelines, "Intellectual property law bestows on the owners of intellectual property certain rights to exclude others. These rights help the owners to profit from the use of their property." (p.3)

Recognizing the importance of intellectual property rights, the Guidelines immediately go on to make clear that these rights are circumscribed by antitrust law: "An intellectual property owner's rights to exclude are similar to the rights enjoyed by owners of other forms of private property. As with other forms of private property, certain

¹¹Let me stress that I am not addressing access issues in regulated industries here. In many regulated industries, including telecommunications, competitors' rights to access are well established as a matter of regulatory policy.

types of conduct with respect to intellectual property may have anticompetitive effects against which the antitrust laws can and do protect. Intellectual property is thus neither particularly free from scrutiny under the antitrust laws, nor particularly suspect under them." However, while there is no presumption that intellectual property confers significant market power, it is worth noting that a firm owning intellectual property giving it control over a proprietary *de facto* network standard may well have such power.

Intellectual property rights are attenuated when a firm controlling intellectual property -- patents, copyrights, or trade secrets -- relevant to a standard has committed itself to an "open" standard in order to obtain industry support for the standard in the first place. In that situation, subsequent efforts to gain control of that standard by asserting these same intellectual property rights can implicate competition and raise antitrust concerns.

The FTC pursued this theory in its case against Dell Computer Corporation last November.¹² In that case, the FTC alleged that Dell had restricted competition and undermined the standard-setting process by threatening to exercise undisclosed patent rights against computer companies adopting the VL-bus standard. The VL-bus is a mechanism to transfer instructions between the computer's central processing unit and its peripherals, such as a hard disk drive or video display hardware. The FTC complaint states that Dell participated in

¹²In the Matter of Dell Computer Corporation, File No. 931-0097.

the standard-setting process of the Video Electronic Standards Association (VESA) in 1992, that a Dell representative certified that he knew of no patent that the bus design would violate, and that Dell later contacted certain VESA members and asserted that they were violating a 1991 Dell patent by using the VL-bus standard.¹³

The Antitrust Division shares the FTC's concerns that firms may manipulate or abuse the standard-setting process by asserting that complying with an agreed-upon standard violates their intellectual property rights. If indeed the standard lacks reasonable substitutes, monopoly power may be at stake, raising antitrust concerns, as well as intellectual property and contract issues. If a firm attempts to capture and control what had been an open standard, it may be guilty of actual or attempted monopolization in a relevant antitrust market, depending upon the specific conduct involved and the ability of other firms to use substitute technology.

The Antitrust Division is also concerned about situations in which a dominant firm alters its product in a manner that offers few or no consumer benefits but reduces the attractiveness of rival products by introducing incompatibilities with those products. So, in my parable, we would be very concerned if USoft took steps, such as modifying its

¹³In another case, I understand that a standard was established under the auspices of the Electronic Industries Association for memory modules in personal computers. Later, the Wang Corporation, after participating in the standards process, asserted that this technology was controlled by their patents, and demanded royalties from Mitsubishi, Toshiba, and others. Litigation ensued.